a transverse horizontal axis 5 from a first position in which the propeller produces a thrust to move the boat forward (as shown in Fig. 4) through a second position in which the propeller produces a downward neutral thrust turning torque (as shown in Fig. 3) to a third position in which the propeller produces a thrust to move the boat in reverse (as shown in Fig. 1) and to a fourth position in which the propeller produces an upward neutral thrust turning torque (as shown in Fig. 2). This invention has the ability to rotate the propeller, to dispose the propeller's rotational axis to a rear horizontal position to propel the boat forward, to a forward horizontal position to propel the boat in reverse and to two vertical positions, while the engine 1 continues to run. The engine powering the propeller being a variable speed engine operable in a single rotational direction, as set forth in claim 7.

Without departing from the generality of the invention disclosed herein and without limiting the scope of the invention, the discussion that follows, will refer to the invention as depicted in the drawing.

The preferred embodiments of the apparatus depicted in the drawing comprise a system to propel an air powered boat is taught by the present invention which comprises means for propelling 10 the air boat in any one of a forward, reverse and neutral turning directions having an engine 1 powering a propeller 2 in a single rotational direction; and means for securing 6 the means for propelling 10 to the air powered boat 12.

One of the unique features of this invention is the ability to rotate the propeller's rotational axis 14 to at least one vertical position while the engine continues to run. When the propeller is thus vertically disposed, the air boat is propelled in a neutral thrust turning direction, neither forward nor reverse. This neutral thrust turning direction tends to turn the air boat to the starboard side or to the port side without substantially moving it forward or reverse. The means for propelling 10 includes

means for rotating 4 the propeller 2 about a transverse horizontal axis 5 from a first position in which the propeller produces a thrust to move the boat forward through a second position in which the propeller produces a downward neutral thrust turning torque to a third position in which the propeller produces a thrust to move the boat in reverse and, in a preferred embodiment, to a fourth position in which an upward thrust is produced. Preferably, the direction of thrust (shown by the linear arrow outlines in Figs. 1-5) from the propeller can be rotated through a 180 or 360 degree arc as the propeller is rotated about the horizontal axis to propel the air powered boat in one of a forward direction, a neutral turning direction, and a reverse direction. As best shown in Fig. 6, the transverse horizontal axis 5 may lie in a plane that is perpendicular to the longitudinal axis of the air powered boat 12. In instances where the propeller is rotated 360 degree about the horizontal axis to propel the air powered boat, control can be accomplished by interposing a universal coupling in the throttle cable. This coupling permits axial translation of the throttle cable along its entire length to control the throttle setting as well as unlimited rotational movement of the end of the cable attached to the engine. This can be accomplished by mounting one end of the throttle control cable to the coupling body and the other end to a shaft having a head secured in the coupling body for swiveling movement within the coupling body.

The means for rotating 4 the propeller 2 includes a direct drive 7 controllable by a pilot to rotate the propeller about the transverse horizontal axis 5 to one of the first position, second position, third position and preferably a fourth position. Moreover, the propeller is preferably of an aerodynamic design 16 for producing thrust, as shown in Fig. 6.

As best shown in Fig. 6, the means for propelling 10 has a tangential shroud 8 which supports the propeller 2 and rotates about the transverse horizontal axis 5 with the propeller. Thus, although

not specifically shown in the drawing, the rotating propeller 2 could be independently supported by the shroud 8 and the engine could be independently supported by a frame 3. As shown in the drawing, however, both the propeller 2 and the engine 1 powering it are supported by the shroud 8. The shroud 8 has an internal framework 18 for supporting the propeller 2, as shown in Fig. 6.